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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/692,075	10/19/2000	Ken Harris	22176	6304

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LEXINGTON, MA 02421

EXAMINER

ANGEBRANDT, MARTIN J

ART UNIT	PAPER NUMBER
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1756

DATE MAILED: 06/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/692,075

Applicant(s)

HARRIS, KEN

Examiner

Martin J Angebranndt

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 March 2004.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 26, 28, 29 and 32-44 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☒ Claim(s) 29 and 37-42 is/are allowed.
6) ☒ Claim(s) 26, 28, 32-36, 43 and 44 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

1a The response provided by the applicant has been read and given careful consideration. Response to the arguments forwarded by the applicant are provided after the first rejection to which they are directed. Claims 1-25,27,30,31 have been cancelled. Claims 26,28,29 and 32-44 are under prosecution.

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over IBM Technical Disclosure Bulletin Vol. 30(3) pp. 1392-1393 (08/1987), in view of Shvartsman '689 and Kataoka et al. JP 08-039572.

IBM Technical Disclosure Bulletin Vol. 30(3) pp. 1392-1393 (08/1987) teaches the formation of a holographic surface relief grating including spin coating a photosensitive polyimide, pre-baking at 85 degrees C, exposing the polyimide with light from a HeCd laser to record the holographic image, and a postbaking/development at 225 degrees C. The polyimide allows dry or wet development, which is disclosed as an advantage.

Shvartsman '689 describes the coating of a photohardenable film on a substrate , embossing a pattern into it , curing it while in contact, peeling and transferring the relief image in the photohardened film to another surface by stamping. (8/56-9/21) The use of roller or flat die shapes is disclosed. (9/22-55). See also the examples. Holograms can include images and or text stored holographically.

Kataoka et al. JP 08-039572 teaches the use of a patterned photosensitive polyimide on the interior surface of a mold. These are pre-heated at 50 degrees and post-baked at 240 degrees in the examples. [0031].

It would have been obvious to modify the process of IBM Technical Disclosure Bulletin Vol. 30(3) pp. 1392-1393 (08/1987) as discussed above, by using the surface relief hologram formed on the flat surface to replicate itself in other materials as stamping is disclosed as Shvartsman '689 and Kataoka et al. JP 08-039572 who establish that cured photosensitive layers, including polyimides are known to be useful as masters for stamping and molding and to use another mode for forming the diffraction pattern, such as the embossing of the photosensitive layer and curing it while in contact with the master as taught by Shvartsman '689 as this allows more rapid hologram formation than using the exposure and development process of IBM Technical Disclosure Bulletin Vol. 30(3) pp. 1392-1393 (08/1987) as it obviates the use of a development step to achieve the relief image.

The applicant argues that spin coating as used in the IBM reference does not refer to the spin coating on the roller as contemplated by the claims. The applicant also argues that wet development is taught away from. The applicant also points out that heat curing is not taught by Shvartsman et al. The applicant also argues that the material of Shvartsman et al. cannot be imaged by light.

The examiner notes that claim 26 is not limited to spinning a roller and that the term "spin coating" is broader than argued by the applicant. The manner in which the applicant uses the term is unusual, but not repugnant to the accepting meaning of the language. The examiner notes that claim 26 does not even include a recitation of "spin coating", "wet development" or

“heat curing” and therefore these argument are not commensurate with the scope of coverage sought. The materials is Schvartsman er photoresist material, in particularl negative acting acrylate materials and inherently undergo hardening and insolubilization in response to light (4/1-15 in Schvartsman et al.). Therefore the argument that the Schvartsman materials cannot be imaged by light is flawed.

3. Claims 28,33,35 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sassmannshausen et al. ‘768, in view of IBM Technical Disclosure Bulletin Vol. 30(3) pp. 1392-1393 (08/1987), Shvartsman ‘689, Kataoka et al. JP 08-039572, Fan et al. EP 0766142 and McGrew ‘030.

Sassmannshausen et al. ‘768 teaches the use of *positive acting polyimide resists* for fabricating relief structures useful in fabricating microelectronics and printing plates. (1/11-30). Processing of the polyimide resists includes coating, pre-baking at 50-120 degrees C, exposure, aqueous alkaline development and post-baking at 200-400 degrees C. (6/23-7/39).

Fan et al. EP 0766142 describes seamless printing plates, which are useful for printing plates. (5/9-17). The use of printing cylinders allows continuous printing. (2/30-34)

McGrew ‘030 discloses that the transfer layer may be a **photoresist** applied to the roller from a tank of liquid photoresist, which would not leave a seam in the photosensitive coating allowing continuous embossing (2/58-59) and is disclosed as useful in the printing arts. (4/26-38). The use of **positive resist** is disclosed (3/57-62) After development of the pattern, the pattern may be transferred into the underlying layer by etching. See figures 4-8 concerning light exposure of the resist.

It would have been obvious to one skilled in the art to modify the processes of Sassmannshausen et al. '768 by using the polyimide print surface to form an embossing grating surface based upon the use of polyimides to form gratings using interferometric exposure as evidenced by IBM Technical Disclosure Bulletin Vol. 30(3) pp. 1392-1393 (08/1987) and the use of polyimides and other resists to mold/emboss other soft materials as taught by Shvartsman '689, Kataoka et al. JP 08-039572 coated on rollers based upon the ability to perform continuous printing and to use the coating processes of McGrew '030 which are disclosed as useful in the printing arts by Fan et al. EP 0766142.

In addition to the response provided above, the examiner point to the fact that the Fan et al. EP 0766142 and McGrew '030 references teach the same roller coating process described by the applicant in the instant specification and clearly indicate the seamless nature of the coating.

4. Claims 28,32,33,35 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sassmannshausen et al. '768, in view of IBM Technical Disclosure Bulletin Vol. 30(3) pp. 1392-1393 (08/1987), Shvartsman '689, Kataoka et al. JP 08-039572, Fan et al. EP 0766142 and McGrew '030, and further in view of Abraham '282.

Abraham '282 teaches the formation of dot matrix gratings or regular gratings in photoresists and the use of these as stampers. (3/11-50)

In addition to the basis provided above, the examiner holds that it would have been obvious to use the processes Sassmannshausen et al. '768 combined with IBM Technical Disclosure Bulletin Vol. 30(3) pp. 1392-1393 (08/1987), Shvartsman '689, Kataoka et al. JP 08-039572, Fan et al. EP 0766142 and McGrew '030., such as dot matrix holograms as the image to

be formed in the stampers based upon the teachings of the formation of these holograms in stamper surfaces by Abraham '282.

The responses above address the arguments of the applicant.

5. Claims 28,33-36 and 43-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sassmannshausen et al. '768, in view of IBM Technical Disclosure Bulletin Vol. 30(3) pp. 1392-1393 (08/1987), Shvartsman '689, Kataoka et al. JP 08-039572, Fan et al. EP 0766142 and McGrew '030, and further in view of Hino et al. '469 and/or Hagan et al. '825.

Hino et al. '469 teach that if the heating temperature is below 400 degrees C, that imidization does not sufficiently proceed and that to correct for this curing takes place under a nitrogen atmosphere (8/1-14).

Hagan et al. '825 teach the use of negative polyimide resists which are aqueous developable (16/11-37). This is described as an advantage over other polyimides, which cannot use aqueous developers. The use of these compositions in forming microelectronics, photoresists and print plates is disclosed. (17/30-37).

It would have been obvious to modify the invention of Sassmannshausen et al. '768, combined with IBM Technical Disclosure Bulletin Vol. 30(3) pp. 1392-1393 (08/1987), Shvartsman '689, Kataoka et al. JP 08-039572, Fan et al. EP 0766142 and McGrew '030 as discussed above by curing under a nitrogen atmosphere to ensure sufficient imidization as taught by Hino et al. '469 and/or the use a negative polyimide resist which shares the advantage that it is developable using an aqueous developer. There is no evidence that the polarity (negative acting or positive acting) of the polyimide has any advantage.

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6. Claims 29 and 37-42 allowed. The prior art of record does not teach the process as claimed, including the imaging and patterning of the seamless polyimide coating, forming a metal layer on this, applying ink to the result and using it to print upon a surface.

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

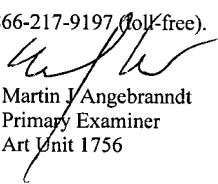
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

8 Any inquiry concerning this communication or earlier communications from the examiner should be directed to Martin J Angebrannt whose telephone number is 571-272-1378. The examiner can normally be reached on Monday-Thursday and alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on 571-272-1385. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Martin J. Angebranndt
Primary Examiner
Art Unit 1756

05/31/2004